Log Event A

Borehole # 20-12-03

Borehole Information

Farm : B	**Tank :** B-112	**Site Number :** 299-E33-199
N-Coord : 45,438	**W-Coord :** 52,800	**TOC Elevation :** 652.03
Water Level, ft :	**Date Drilled :** 1/31/1972	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:

Borehole 20-12-03 was drilled in January 1972 to a depth of 100 ft and was completed with 6-in. casing. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. These references do not indicate that the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 2B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 11/1997	**Calibration Reference :** GJO-HAN-20	**Logging Procedure :** MAC-VZCP 1.7.10-1

Logging Information

Log Run Number :	1	**Log Run Date :**	11/05/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	12.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	11/06/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	99.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	11.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	11/06/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	50.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	35.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

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Logging Operation Notes:

This borehole was logged by the SGLS in three log runs. The third logging run was performed as an additional log data quality check and to demonstrate the repeatability of the data acquisition system. The top of the borehole casing, which is the zero reference for the SGLS, is even with the ground surface. The total logging depth achieved was 99.0 ft.

Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 03/22/1999

Analysis Notes :

The pre-survey and post-survey field verification for the logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.280-in.-thick steel casing was applied to the concentration data during the analysis process.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots indicate the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of the rerun section is included to compare the repeatability of the logging system between two separate log runs.

A plot of historical logs is included to show relative changes in count rate over time and to indicate decay of gamma-emitting radionuclides.

Results/Interpretations:

The man-made radionuclides Cs-137 and Co-60 were detected around this borehole. The Cs-137 contamination was detected almost continuously from the ground surface to a depth of 18 ft and at isolated locations at depths of 19, 21.5, and 43 ft. The measured Cs-137 concentrations were all less than 4 pCi/g, with a maximum concentration of about 4 pCi/g at 1 ft.

Minor amounts of Co-60 contamination were detected between 67 and 69 ft and at about 85 ft. The Co-60

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concentrations were all below 0.3 pCi/g.

The K-40 concentrations increase at about 40 ft, representing the transition from the backfill material to the undisturbed Hanford formation sediments.

Historical gross gamma logs dating to 1973 indicated contamination between 60 and 90 ft in depth. This contamination decayed away by 1982 suggesting a short-lived radionuclide such as Ru-106.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks B-109 and B-112.